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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/566,362

12/28/2006

Yukihide Iwamoto

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3478

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BIRCH STEWART KOLASCH & BIRCH  
PO BOX 747  
FALLS CHURCH, VA 22040-0747

EXAMINER

POPA, ILEANA

ART UNIT

PAPER NUMBER

1633

NOTIFICATION DATE

DELIVERY MODE

09/29/2011

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/566,362	IWAMOTO ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	ILEANA POPA	1633	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07/21/2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 5) ☒ Claim(s) 1-3 and 5-12 is/are pending in the application.
- 5a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 1-3 and 5-12 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____.                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____.   | 6) <input type="checkbox"/> Other: ____.                          |

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/21/2010 has been entered.

Claim 4 has been cancelled. Claims 1-3 and 6-12 have been amended.

Claims 1-3 and 5-12 are pending and under examination.

2. All rejections pertaining to claim 4 are moot because the applicant cancelled the claim in the reply filed on 06/22/2010.

The following rejections are withdrawn in response to the amendments to the claims filed on 06/22/2010, specifically to recite that the cells are seeded as spheroids:

The rejection of claims 1 and 4-6 under 35 U.S.C. 102(b) as being anticipated by Britt et al. (Arch. Otolaryngol. Head Neck Surg., 1998, 124: 671-677);

The rejection of claims 2-6 under 35 U.S.C. 102(b) as being anticipated by van Susante et al. (Biomaterials, 2001, 22: 2359-2369); and

The rejection of claims 1-12 under 35 U.S.C. 103(a) as being unpatentable over Anderer et al. (Journal of Bone and Mineral Research, 2002, 17: 1420-1429), in view of

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each Tsutsumi et al. (Exp. Biol. Med., 2002, 227: 402-411), Long et al. (WO 01/48148), Hoffmann et al. (J. Cell Sci., 2001, 115: 769-781) and van Susante.

### ***Information Disclosure Statement***

3. Acknowledgment is made of applicant's submission of a partial English translation of the Abstract and claims of JP 2003-518379.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3 and 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderer et al. (Journal of Bone and Mineral Research, 2002, 17: 1420-1429; of record), in view of each Kreklau et al. (Biomaterials, 1999, 20: 1743-1749), Long et al. (WO 01/48148; of record) and Denker et al. (Differentiation, 1995, 59: 25-34; of record).

Anderer et al. teach a method of producing a neo-cartilage for transplantation, the method comprising **(i)** providing a human articular cartilage; **(ii)** isolating the chondrocytes from the cartilage; **(iii)** culturing the chondrocytes to form spheroids; **(iv)** seeding a plurality of spheroids onto a hydrogel-coated tissue culture dish (i.e., a surface); **(v)** and culturing the spheroids in a medium comprising fetal calf or autologous human serum (i.e., in the presence of TGF- $\beta$ ). Anderer et al. teach that the spheroids

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adhere to the surface, coalesce (i.e., fuse to each other), and produce new cartilage on the surface (claims 1-3, 5, 6, and 12) (Abstract; p. 1421, column 1; p. 1422; p. 1423, column 1; p. 1426, column 2, first paragraph).

Anderer et al. do not teach seeding the spheroids on a carrier shaped in a desired form (claims 1, 2, and 11). Kreklau et al. teach that, for extensive cartilage loss, the neo-cartilage must be deposited on a suitable support (such as a calcium carbonate support) before being inserted into the defect (Abstract; p. 1743, column 2; p. 1744, column 1 and Fig. 2). It would have been obvious to one of skill in the art, at the time the invention was made, to modify the method of Anderer et al. by seeding the spheroids on a support, with a reasonable expectation of success. One of skill in the art would have been motivated to do so in order to obtain an implant suitable to treat extensive cartilage loss. One of skill in the art would have reasonably expected to be successful in doing so because the prior art teaches that spheroids can be successfully seeded on solid supports. With respect to the limitations of shaping the carrier into a desired form (claims 1, 2, and 9-12), one of skill in the art would have known to shape the solid support such as to fit the defect.

Anderer et al. and Kreklau et al. teach a calcium carbonate and not a calcium triphosphate carrier having micropores with a diameter of 10-500  $\mu$  (claims 7 and 8). Long et al. teach that calcium triphosphate supports having pores of 50  $\mu$  are suitable as carriers for spheroids obtained by culturing C3/H101/2 murine mesenchymal stem cells in the presence of TGF- $\beta$  (p. 3, p. 4, fourth paragraph, p. 10, second full paragraph, p. 13, second paragraph, p. 28, last paragraph, p. 29). Denker et al. teach

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that C3/H101/2 form cartilage-like spheroids (Abstract). It would have been obvious to one of skill in the art, at the time the invention was made, to modify the method of Anderer et al. and Kreklau et al. by replacing their carrier with the calcium triphosphate carrier of Long et al. and/or replacing their chondrocytes with mesenchymal stem cell to achieve the predictable result of obtaining a neo-cartilage suitable to treat extensive cartilage loss.

Anderer et al., Kreklau et al., and Long et al. teach murine mesenchymal stem cells and not teach mesenchymal stem cells derived from human bone marrow (claims 9 and 10). However, it would have been obvious to one of skill in the art, at the time the invention was made, to replace their mesenchymal stem cells with mesenchymal stem cells derived from human bone marrow to achieve the predictable result of obtaining a cartilage suitable for implantation in humans.

Thus, the claimed invention was *prima facie* obvious at the time it was made.

6. No claim is allowed. No claim is free of prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ILEANA POPA whose telephone number is (571)272-5546. The examiner can normally be reached on 9:00 am-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Voitach can be reached on 571-272-0739. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ileana Popa/  
Primary Examiner, Art Unit 1633